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An Introduction to CODINVOLVE: A System for Analyzing, Storing, and Retrieving Public Input to Resource Decisions

by

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ABSTRACT

The Codinvolve System for analyzing the content of public input was developed in response to increasing requests by land managers for a tool to handle the citizen input they were receiving. The concepts and criteria on which the system was based are discussed. General procedures for applying Codinvolve are explained.

Keywords: Information retrieval systems, public opinion, public policy (- forests).

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INTRODUCTION

The purpose of this research note is to describe the Codinvolve System in general terms and show how it can be used to analyze public input and where it fits in the public involvement process. It explains the basic concepts and assumptions underlying Codinvolve. But this is not a comprehensive instructional guide. Readers interested in applying the system are referred to the users' manual.^{2/}

THE NEED FOR A WAY TO ANALYZE PUBLIC INPUT

Public involvement in decisionmaking has become a way of life for resource managers. Laws, agency policies, and sincere desire to do a better job of management have led to programs soliciting public input. Citizen response often has been overwhelming. Administrators swamped with literally thousands of inputs of varying kinds and complexity are asking, "What now?"

The Codinvolve System was developed to handle these accumulations in a systematic, objective fashion. The important opinions, values, and factual and emotional information need not be obscured by sheer volume. The whole spectrum of public input now can be summarized for decisionmakers to review easily.

The basic concept underlying systematic content analysis of public input is that the common denominators of virtually all public input are the opinions offered for, against, or about the issues in question. These opinions are frequently supported by reasons. The number and kinds of reasons can vary considerably, even those given to support the same opinion.

This combination of opinions and their supporting reasons defines the values the public holds with regard to the issue in question. Opinions offered with incorrect or inaccurate reasoning might sometimes be subject to change with new information--but they still tell something about the value orientations of the public and give valuable clues about how the agency might respond.

The basic goal of systematic analysis of public input is to identify and display in detail the combination of opinions and supporting reasons contained in the public input received by decisionmakers.

^{2/} Photocopies of the Codinvolve Users' Manual by Roger N. Clark, George H. Stankey, and John C. Hendee will be available after June 1974 from Recreation Research, 4507 University Way N.E., Seattle, Washington 98105.

CODINVOLVE: WHAT IT IS AND IS NOT

Codinvolve is a flexible, content-analysis system specifically designed for objective analysis of public input--coding, storing, retrieving, summarizing, and displaying that input as it is needed. Codinvolve is based on a coding process which provides quantitative summaries of all opinions expressed (how many opinions for or against an alternative or issue) and qualitative descriptions of supporting reasons (why people feel as they do). Regardless of the form which input takes (personal letter, petition, report, or whatever), Codinvolve readily breaks down the content by opinion expressed and reasons given to support it. A major advantage of the system is that it stores all the information contained in the input for future retrieval, a valuable aid to multiple-use planning or special area management over several years' time.

Codinvolve *is not* a computer program or an edge-punch, card-sorting system. Codinvolve is a "systems" approach for analyzing public input; computers and edge-punch, card-sorting procedures are two tools used to do the job. The choice of which tool to use depends on the amount of input and the complexity of the particular issue.



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THE CODINVOLVE SYSTEM'S BACKGROUND

Codinvolve was developed in response to a growing number of requests from Forest Service resource managers for assistance in handling large amounts of public input. These managers were concerned that without a systematic way of analyzing and summarizing the input, they were being swamped by its volume. How then could they follow through on their pledge to the public to consider all opinions.

An early effort to apply content analysis was made in 1969 on the Wilderness Study of the Mission Mountain Primitive Area in Montana (Stankey 1972). There, content analysis was applied to public input, but without a comprehensive "systems" approach to coding, analyzing, displaying, storing, and retrieving the data.

The Codinvolve System was developed and tested early in 1972 when large amounts of public input poured in to the Forest Service in response to its roadless-area review and some controversial environmental-impact statements. Since then, Codinvolve has been field tested, revised, and improved. It has been applied to more than 20 different National Forest management issues involving more than 30,000 pieces of public input. It has been used on such specific topics as proposing new areas for wilderness classification and on broad, multiple-use planning tasks involving numerous interrelated issues. On every issue to which it was applied, Codinvolve won endorsement for providing a useful summary and analysis of voluminous public input.

In September 1973, a Forest Service research-applications workshop on public input analysis was held in Seattle, Washington. In it, a cadre of 35 people from the Forest Service across the Nation learned to use Codinvolve in analyzing public input. These people now are applying the Codinvolve System to management issues in their home regions and holding training sessions to further extend the technique.

Several other Federal and State agencies are also involved in applying the system to their needs.

CODINVOLVE AND THE PUBLIC INVOLVEMENT PROCESS

Public-involvement programs come in many forms and include many activities depending on the planners' approach and the complexity of the issues involved (Frear 1973, Hendee et al. 1973, Reinke and Reinke 1973). Regardless of the overall approach used, if public response is large, an analysis system such as Codinvolve will be needed.

The Codinvolve System is used after input has been received. Users of the system must take public expressions at face value since Codinvolve won't make corrections for any shortcomings in citizens' input. Although using the system can provide insight into other

aspects of public involvement, it cannot assure effective public involvement when used alone. Codinvolve will not make judgments, nor will it make decisions. It is a tool for analysis--nothing more.

PRINCIPLES THAT MAKE PUBLIC INPUT ANALYSIS EFFECTIVE^{3/}

The purpose of analysis is to summarize and display the number, content, and nature of public responses so that they can be considered in making recommendations and decisions. Thus, public-input analysis seeks to identify public opinion and values, their underlying reasons, and new ideas and information about issues, geographic areas, and resource-management alternatives.

To fully understand the Codinvolve System, it is necessary to examine the principles on which it is based. We feel that any system for analyzing public input should satisfy these criteria:

1. *Analysis is separate from evaluation.* Evaluation is subjective. It interprets the importance of various kinds of public input and integrates them with other factors in order to reach a decision. The importance of various kinds of input is decided in the evaluation stage, *not* during analysis. Analysis seeks only to describe what the public said as completely and directly as possible; it does not assign any weights or policy recommendations. But analysis must describe how the input differed according to variables the decisionmaker might think are important. For example, it might compare the content of letters with that of petitions, show local views in relation to nonlocal ones, or sort out individual responses from those of groups.

2. *Decisionmaking questions guide analysis.* Before analysis can be meaningful, the decisionmaker must spell out questions he wants answered about the public input he has received. Often, full-scale public-involvement efforts are undertaken without any formal consideration of how public input will be analyzed or focused on the issue in question.

Analysis attempts to answer such questions as: What opinions were expressed concerning management alternatives, general issues, and specific areas? Why do people feel as they do, or what reasons were given to support the opinions they expressed? How did opinions vary according to such important factors as form of input (statements at

^{3/} Much of the following material comes from John C. Hendee, Roger N. Clark, and George H. Stankey. 1974. A Framework for Using Public Input in Resource Decision-making. Manuscript awaiting publication in the Journal of Soil and Water Conservation. A 30-minute slide-tape presentation of these concepts also has been developed by the authors and is available from Recreation Research, 4507 University Way N.E., Seattle, Washington 98105.

meetings, personal letters, formal reports, petitions, form letters, etc.)? Who responded (individuals or organizations)? Where did the input originate (locally, regionally, or nationally)? What additional information, ideas, and issues were presented?

If the decisionmaker can spell out early in the public involvement process those questions he needs answered, a much more effective job can be done in obtaining and analyzing input to provide useful information.

3. *All input is relevant and must be processed.* Because all input expresses opinions and values, it all has implications important to the decisionmaker. Analysis must include all input, regardless of its form or detail. Both general opinions and well-reasoned arguments (some of them highly complex proposals) are expressions of values. They differ only in level of understanding and articulateness with regard to technical matters and resource-management detail. Thus, analysis must record and summarize all public input--including emotional statements, general opinions, and other expressions of values--as well as the more specific comments and detailed management proposals.

4. *Analysis must be systematic, objective, visible, and traceable.* Effective analysis calls for these characteristics:

It must be *systematic*. Analysis should follow a structured procedure which checks and balances the way in which input is handled and processed.

It must be *objective*. Personal prejudices and subjectivity must not affect the way in which input is summarized. Analysis must assure that an independent review would generate the same information.

It must be *visible*. It must be recognized by administrators and public alike as a distinct and necessary phase in the public-involvement process. In addition, the product of analysis must be available for review by concerned parties.

It must be *traceable*. An independent party should be able to follow the manner in which input was handled. The system must leave "tracks" so analysis could be replicated.

5. *Identity of the input must be maintained.* It is important that no combining, weighing, or evaluating of input be done during the analysis. Results from different kinds of public involvement must be summarized separately so the decisionmaker can distinguish between different kinds of input when deciding what importance to attach to them. Results of workshops cannot be lumped with personal letters, responses from organizations cannot be combined with individual opinions, and oral statements cannot be included with petitions because there may be different implications for each kind of input.

Their contents must be summarized separately so each can be studied for its unique implications.

6. *Analysis must be a continuing process.* Analyzing citizen input can be a problem because important resource-management decisions often evolve over several years. Public input which affects a given decision might be solicited and concentrated in a critical period prior to the decision. However, many inputs precede or follow the formal collection stage, in some cases by several years. The balance of opinion can change as more people become involved, more and better information is obtained, and public attitudes shift in response to changing situations. For instance, the recent "energy crisis" has probably caused some people to change their attitudes about coal mining. Therefore, it is essential that the analysis of public input reflect comments made before any special appeal for response, and that subsequent input be recorded for subsequent retrieval when needed, or when significant shifts in opinion and values are suspected. Interested persons should not be required to resubmit their views time and again to coincide with administrative convenience. It should be possible for managers to consider all input, even that which does not follow a special appeal for response.

CRITERIA FOR EFFECTIVE ANALYSIS

From these broad principles, we can derive specific criteria for an ideal method of analyzing public input:

a. The method should *summarize the extent, content, and nature of public input* in relation to the decisionmakers' questions.

b. It must be *objective*.

c. It should be *visible* and *traceable*.

d. It must be *reliable* in that the opinions expressed are recorded the same way by different analysts.

e. It should provide for *uniform application between different administrative units*.

f. It should be *flexible to accommodate different conditions*.

g. It should have the *capacity* to handle large quantities of input, have *storage* and *retrieval* capabilities, and capacity to *assimilate continuing input*.

h. It should *summarize the balance of opinions expressed and describe variations in each opinion*.

i. It should *provide other descriptive and qualitative information about the content and nature of the input*.

j. It should *facilitate environmental analysis leading to the preparation of final, environmental-impact statements* by identifying significant new information and arguments for and against the proposed actions.

Although there is no single ideal method for analyzing public input, the system chosen should be examined in light of the above. These criteria have guided development of the Codinvolve System.

STEPS IN COMPLETING A CODINVOLVE ANALYSIS OF PUBLIC INPUT

Codinvolve provides for the orderly and systematic transfer of information contained in any type of written input to a form that can be summarized easily for review. The basic steps in completing a Codinvolve analysis are shown in figure 1. The diagram also distinguishes analysis from evaluation. With input in hand, the analyst must provide an objective summary which answers the decisionmakers' questions and describes the full content of that input. Briefly, steps in doing this job are:

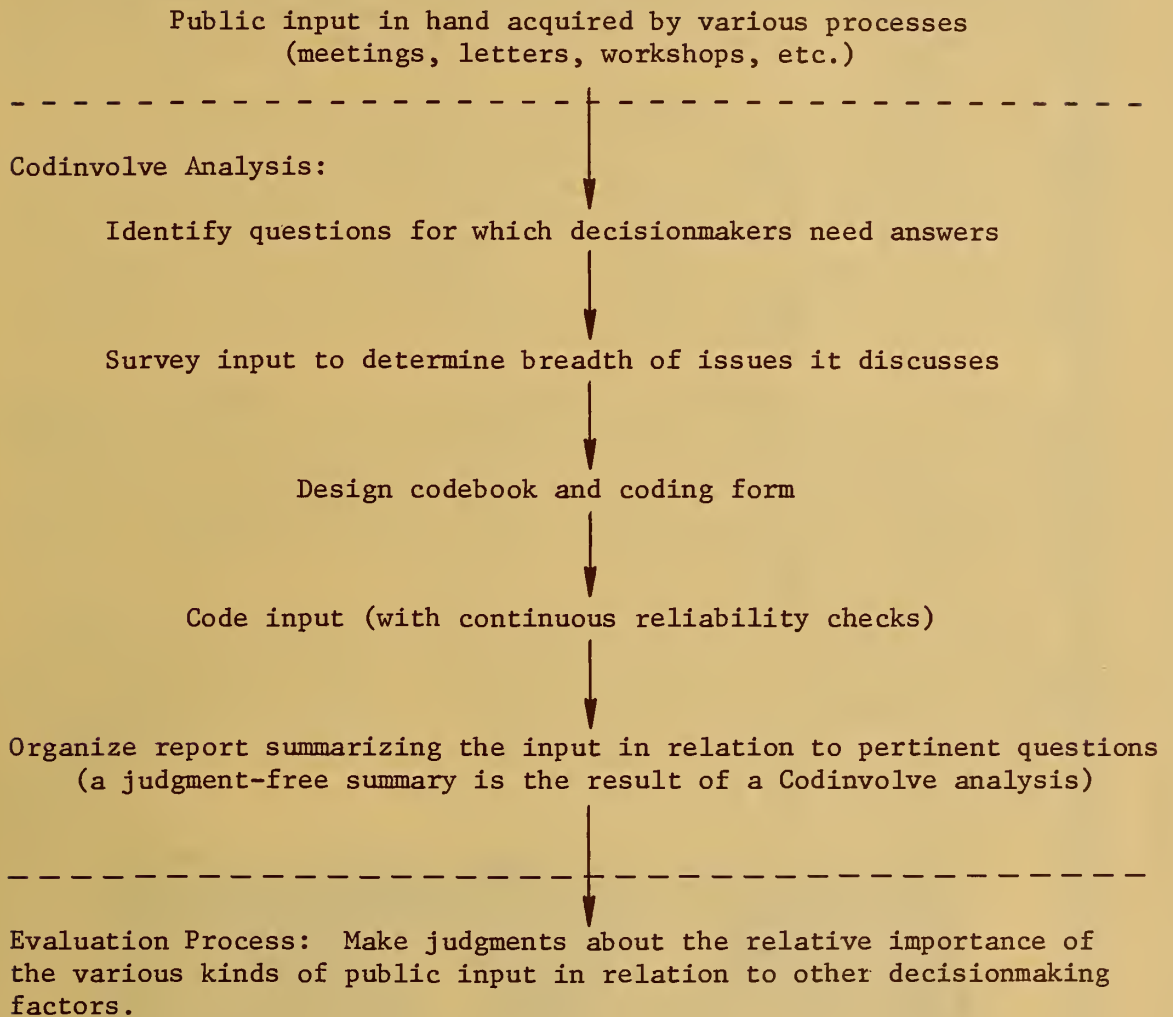
1. *Identifying questions for which decisionmakers need answers.* It is essential that the analyst know what information the decisionmaker wants from the public input. What is he looking for? This is the key to a useful analysis. The analyst must consult decisionmakers to insure that nothing important is overlooked. (See page 5 for examples of specific questions decisionmakers often ask.)

2. *Surveying input to determine breadth of issues it discusses.* This step provides an overview of issues discussed and information provided in the input. Although it is important to specify decision-making questions, it is just as important that the structure of the analysis system not filter out any new or unanticipated information. To be responsive to the varying nature of input, the analysis system must have the capability to capture the full breadth of public input so it can be summarized for review.

In order to determine the breadth of issues which input discusses, a sample of input is captured by means of a content summary reflecting the substance of comments. The content summary defines the range and diversity of opinions, supporting reasons, and factual material contained in the input.

3. *Designing codebook and summary form.* The two basic documents for a Codinvolve analysis--the codebook and summary form--are built around the results of the previous step.

Figure 1.--*Flow diagram focusing on a Codinvolve analysis.*



The *codebook* contains instructions, definitions, and examples which show how information should be coded. It is a basic reference document, and any changes in coding procedures must be noted in it. It is important that the codebook contain detailed and clear instructions. Reliability, the assurance that each coder's work will replicate that of other coders, is crucial to the system's success. In order to insure reliability among coders, the set of instructions from which they work must be clearly understandable and uniform.

The codebook tells the coder how to use the *summary form* on which information from the input will be recorded. Depending upon specific circumstances, the summary form might be an edge-punch card (as has been used in several Codinvolve studies) (fig. 2) or a computer card.

4. *Coding input.* Coding is the process of transferring the content of public input to a form that facilitates summary. The major objective in coding is to capture accurately and objectively the complete scope of information gathered. The principal obligation of the coder is to record only what the citizen said--not what the coder thinks he means. Coding is a process that must be entirely objective and replicable. This is possible with careful attention to coding procedure and training of coders.

To assure coder accuracy, reliability must be checked at regular intervals. These checks monitor how carefully the coder is following directions and objectively recording the content of input, how well instructions and directions in the codebook have been developed, and what revisions or additions to the codebook might be needed. Regular updating of instructions usually is necessary.

Coding is a demanding job, and not everyone can do it. Persons who do not rapidly acquire the necessary skill should not continue coding. Ideal coders, from the standpoints of both accuracy and cost, usually are technical and clerical staff. Personal or professional knowledge about the issue at hand is not necessary and in some cases may actually interfere with objective coding.



Coding is the process of accurately and objectively transferring the content of public input to a form that facilitates summary for use by decisionmakers.

Experience indicates that it takes at least 3 to 4 days to train a group of coders. Reliability during this period usually starts at 50 to 65 percent and rises to 90 percent or higher.

The amount of input that a coder can handle without losing a significant degree of reliability varies with individuals and with differing types of input. For fairly complex letters, average output is nearly 50 a day; beyond that number, reliability begins to decline sharply. Structured types of input are easier to code, so form letters and coupons can be handled more quickly, sometimes at a rate of nearly 150 or 200 a day. Analysts should remember that the principal concern is accuracy, not the rate.

Adequate time must be allocated for coding. If enough coders are not available, additional time will be needed to complete the job.

Experience indicates that it takes at least 3 to 4 days to train a group of coders.



5. *Organizing a report to summarize input in relation to pertinent questions (a judgment-free summary).* Upon completion of coding, the analyst is ready to summarize the information into a form easy for decisionmakers to use. Sorting usually is done either by hand (using edge-punch cards), by computer, or both. Each method is effective, but we have found the long-range retrieval potential to be far greater with hand sorting of edge-punch cards since they can be used by untrained personnel in even remote field locations.

The end product of Codinvolve is a set of tables which summarizes all public input. To answer the questions spelled out earlier, and to display the sentiment expressed by the public on other issues, analysts must organize tables which portray the data. For instance, if decisionmakers are interested in how public response regarded three alternatives, they might want tables that show how opinion varied according to form of input, residence, who responded, and so forth. It is particularly important that the analyst provide information about *all* issues discussed in the input, and not just that related to the specific, decisionmaking questions. This will insure that new or unanticipated information provided by citizens is not overlooked.

The product of a Codinvolve analysis *is not* a written report. It is the objectively interpreted display of the public input, such as shown in table 1. However, most decisionmakers will request that analysts provide more than a collection of tables. For example, they will be interested in what interpretations the analysts make of these tables, what limitations appear. Writing such reports requires that an analyst interpret the tables with great care to assure that his narrative accurately describes the data. To guard against subjective or erroneous interpretations, draft copies of the reports can be circulated to others for technical review. These reviews are invaluable in keeping interpretation accurate and incorporating points the first writer may have missed.

BUDGET AND TIME REQUIREMENTS

Analyzing the content of public input may appear deceptively easy. Often we've been asked to "drop by this afternoon to show me how it works...I want to analyze 5,000 letters tomorrow." Unfortunately, it isn't that easy to learn or to use Codinvolve. Nor is it cheap in cost or time. As with most inventory systems, learning and using Codinvolve requires some intensive effort on the part of managers, technicians, and coders. Although cost norms have not yet been established, past experience indicates that Codinvolve analysis usually runs between \$1 and \$2 per input.

A decision to use Codinvolve or any other system capable of providing similar information is a decision to commit funds and people. But where significant issues require the analysis of public input the benefits seem well worth the cost.

Table 1.--A hypothetical example showing balance of opinion
according to form of input with supporting reasons^{1/}

Alternative 1	Form of input				
	Letters ^{2/}	Petitions	Reports ^{2/}	Form letters	Total
For	82 (I)	2 (I)	3 (I)	82 (I)	169 (I)
	90 (S)	83 (S)	3 (S)	86 (S)	262 (S)
Against	31 (I)	18 (I)	4 (I)	21 (I)	74 (I)
	35 (S)	645 (S)	5 (S)	21 (S)	706 (S)

(I) = Number of inputs.

(S) = Number of signatures.

^{1/} Readers interested in examining actual reports based on a Codinvolve analysis are referred to:

1. "Summary of National Public Response to the Roadless Area Review Draft Environmental Impact Statement." A report by John C. Hendee and Roger N. Clark, June 1973, 53 p., mimeo. Available on request from the Director of the Division of Information and Education, U.S. Forest Service, USDA South Building, Washington, D.C. 20250.

2. "A Summary of Public Response on the Final Environmental Statement Concerning the Proposed Pelican Butte Winter Sports Development." A report by Lyle E. Jack, 24 p., mimeo. Available on request from the Forest Supervisor, Winema National Forest, U.S. Forest Service, Post Office Building, Klamath Falls, Oregon 97601.

3. "Public Response to the Olympic National Park Draft Wilderness Proposal and Master Plan--Summary and Analysis." A report by the Recreation Research Project, U.S. Forest Service, Pacific Northwest Forest and Range Experiment Station, Seattle, Washington. Available on request from the Regional Director of the Pacific Northwest Region, National Park Service, 4th and Pike Building, Seattle, Washington 98101.

^{2/} List of organizations submitting reports and letters is provided for every opinion discussed.

Reasons given in support of the opinions expressed

Reasons For

Best for economy (151)
Provide jobs (111)
Provide mass recreation (61)
Other alternatives too restrictive (43)
Restricts intensive recreation (26)
Restricts roads (19)
Impact on local economy (9)
Restricts timber harvest (4)
Enough already (1)

Reasons Against

Already too many roads (72)
Need more wilderness (65)
Preserve for posterity (47)
Protect areas from development (31)
Protect areas from timber harvest (22)
Protect areas from general misuse (12)
Last chance (8)
Wildlife values (3)

CONCLUSIONS

The Codinvolve system was devised in response to increasing requests by land managers for a tool to handle the public input they receive. To satisfy the needs of decisionmakers and to protect the integrity of this input, a system was developed which meets the criteria outlined in this paper. To the extent that Codinvolve (or any other system) continues to satisfy these criteria, the results should satisfy both managers and the public they serve.

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